REMARKS/ARGUMENTS

Favorable reconsideration is respectfully requested in light of the above amendments and the following comments. Claims 1, 9, 27-28 and 34 have amended. No new matter has been entered as a result of these amendments. Favorable reconsideration is respectfully requested.

Applicant respectfully traverses the Examiner's apparent rejection of claims 1-3, 8-25, and 27-30 and 33 under 35 U.S.C. §103(a) as being unpatentable over Min, U.S. Patent Publication No. 2005/0092950, in view of McIntosh, U.S. Patent No. 6,100,655. Applicant notes that claims 29-33 have been withdrawn from consideration. One of the requirements of a *prima facie* obviousness rejection is that the cited combination must disclose or suggest each and every claimed element. At a minimum, this requirement has not been met.

Independent claim 1 has been amended to recite:

> 1. (Currently Amended) An actuator configured to actuate a water valve having a valve with a valve stem, the water valve structured to be coupled to a fluid system, the actuator assembly comprising:
>
> a motor configured to drive the valve stem in a first opening direction;
>
> a brake;
>
> a biasing mechanism having one or more linear springs for driving the valve stem a second closing direction that is opposite to the first opening direction, wherein the one or more linear springs provide a sufficient bias to the valve stem ~~biasing mechanism is structured~~ to close the valve ~~stem~~ within a time period that would cause water hammer in the fluid system if the brake were not present; and
>
> wherein the [[a]] brake is configured to ~~for increasing~~ work against the one or more linear springs to increase the time period that the biasing mechanism closes the valve stem by an amount that eliminates water hammer in the fluid system.

As can be seen, claim 1 is directed to an actuator that includes a motor and a biasing mechanism that includes one or more linear springs that provide a sufficient bias to the valve stem to close the valve within a time period that would cause water hammer in the fluid system if the brake were not present, and a brake that is configured to work against the one or more linear springs to increase the time period that the biasing mechanism closes the valve stem by an amount that eliminates water hammer in the fluid system.

Min does not describe or suggest the claimed invention. Instead, Min discloses a device that has a coil spring (36), and not one or more linear springs as recited in claim 1. Moreover, Min does not describe coil spring (36) as providing a sufficient bias to the valve stem to close the valve within a time period that would cause water hammer in the fluid system if a brake were not present, as recited in claim 1. Certainly, one of skill in the art, having read and understood the Min disclosure, would not interpret coil spring (36) as providing a sufficient bias to a valve stem to close the valve within a time period that would cause water hammer in the fluid system if a brake were not present. Nor would it be inherent in Min. As noted in MPEP § 2163.07(a):

> "To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.'" In re Robertson, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999) (citations omitted).

Clearly, it cannot readily be argued that the coil spring (36) of Min necessarily provides a sufficient bias to the valve stem to close the valve within a time period that would cause water hammer in the fluid system if a brake were not present. Nor can it be readily argued that the brake of Min necessarily would increase the time period that the biasing mechanism closes the valve stem by an amount that eliminates water hammer in the fluid system, as recited in claim 1.

The Examiner relies upon McIntosh to suggest that return springs can cause water hammer. However, there is no suggestion within McIntosh that the coil spring (36) disclosed by Min would or should cause water hammer. More specifically, there is no appropriate motivation or reason to add a stronger spring to Min to cause water hammer in the fluid system, as recited in claim 1. In fact, McIntosh would appear to teach away from such a combination because McIntosh teach that using a relatively powerful return spring (e.g. one that would provide a force that would cause water hammer or otherwise constitute a danger) is not a good solution (see, for example, McIntosh, column 1, lines 42-49), and would "increase the complexity and cost just to control slamming or excessive speed. As such, McIntosh cannot reasonably be considered as providing any suggestion or reason for adding a stronger spring to Min in order to cause water

hammer in the fluid system, as recited in claim 1. For these and other reasons, claim 1 is believed to be clearly patentable over Min in view of McIntosh. For similar and other reasons, dependent claims 3-8 are also believed to be clearly patentable over Min in view of McIntosh. Favorable reconsideration is respectfully requested.

Turning now to claim 9, the claim has been amended to recite:

> 9. (Currently Amended) An actuator assembly configured for securement to a water valve having a valve with a valve stem, the actuator assembly comprising:
>
> a gear assembly configured to engage the valve stem;
>
> a motor having an output shaft that is configured to drive the gear assembly in a first direction; and
>
> biasing structure including one or more linear springs configured to drive the gear assembly in a second direction;
>
> a brake for reducing or limiting rotational velocity of the output shaft of the motor when the biasing structure is driving the gear assembly in the second direction, the brake is configured to limit the rotational velocity of the output shaft of the motor to less than 1000 ~~RPMs~~ RPM in order to eliminate water hammer that would otherwise be caused by the bias provided by the one or more linear springs.

It can be seen that claim 9 is directed to an actuator assembly that includes a motor configured to drive the valve in a first direction and a biasing structure, which includes one or more linear springs, is configured to drive the valve in a second direction. Claim 9 also recites a brake that is configured to reduce the rotational velocity of the motor to less than 1000 RPM when the biasing structure is closing the valve in order to eliminate water hammer that would otherwise be caused by the one or more linear springs. Min does not disclose using one or more linear springs. Also, Min does not disclose or suggest using a spring that would cause water hammer. As discussed above, McIntosh does not remedy the noted shortcomings of Min, and in fact, would appear to teach away from such a combination. In addition, neither Min nor McIntosh appear to teach or suggest a brake that is configured to reduce the rotational velocity of the motor to less than 1000 RPM when the biasing structure is closing the valve. Notably, the Examiner has not specified where in either Min or McIntosh such elements can be found. For these and other reasons, the

cited combination cannot be considered as describing or suggesting the claimed invention as recited in claims 9-20. Favorable reconsideration is respectfully requested.

Turning now to claim 21, which recites:

> 21. (Previously Presented) A valve assembly, comprising:
> a valve having an open position and a closed position;
> an actuator assembly coupled to the valve, the actuator assembly configured to move the valve between the open position and the closed position;
> wherein the actuator assembly comprises a damping mechanism configured to limit a speed of the valve when the actuator assembly is moving the valve from the open position to the closed position such that the valve moves from the open position to the closed position in 4 seconds or more, but does not significantly limit the speed when the actuator assembly is moving the valve from the closed position to the open position.

It can be seen that claim 21 is directed to a valve assembly that includes a damping mechanism that slows the valve speed when the valve is closing but does not significantly limit the valve speed when the valve is opening. The claim recites that it take at least 4 seconds for the actuator assembly to move the valve from the open position to the closed position. Neither Min nor McIntosh disclose or suggest a specific time for moving the valve from an open position to a closed position. Thus, the cited combination fails to teach each and every element of the claim, and as such, cannot be considered as describing or suggesting the claimed invention as recited in claims 21-25. Favorable reconsideration is respectfully requested.

Turning now to claim 27, which recites:

> 27. (Previously Presented) A valve assembly, comprising:
> a valve having an open position and a closed position;
> a valve stem operatively attached to the valve;
> a gear assembly configured to engage the valve stem;
> a motor configured to drive the gear assembly to the open position; and
> one or more springs configured to drive the gear assembly to the closed position;
> wherein the motor comprises a damping mechanism for limiting rotational velocity of the motor when the one or more springs are driving the gear assembly to the closed position, wherein the damping mechanism is configured to limit the rotational velocity of the motor only after the rotational velocity of the motor exceeds a threshold speed, wherein the threshold speed is 1000 RPM ~~RPMs~~ or less.

As can be seen, claim 27 is directed to a valve assembly that includes a motor that is configured to drive the valve open, one or more springs that are configured to drive the valve closed and a damping mechanism that limits motor speed when the springs are driving the valve closed and the motor speed exceeds a threshold speed that is no more than 1000 RPM. Neither Min nor McIntosh disclose or suggest a specific speed at which the damping mechanism is activated. Thus, the cited combination fails to teach each and every element of the claim, and as such, cannot be considered as describing or suggesting the claimed invention as recited in claims 27-28. Favorable reconsideration is respectfully requested.

Applicant respectfully traverses the Examiner's rejection of claim 4 under 35 U.S.C. §103(a) as being unpatentable over Min, in view of McIntosh, and further in view of Weiss et al., U.S. Patent No. 6,097,123. Claim 4 depends from claim 1, which is distinguished above as being patentable over Min and McIntosh. As Weiss et al. is not believed to remedy the noted shortcomings of Min and McIntosh, claim 1 is believed to be clearly patentable over all three references. As claim 4 includes the elements of claim 1 and moreover adds additional features, claim 4 is also believed to be clearly patentable. Favorable reconsideration is respectfully requested.

Applicant respectfully traverses the Examiner's rejection of claim 5 under 35 U.S.C. §103(a) as being unpatentable over Min, in view of McIntosh, and further in view of Boucher, U.S. Patent No. 6,688,438. Claim 5 depends from claim 1, which is distinguished above as being clearly patentable over Min and McIntosh. As Boucher is not believed to remedy the noted shortcomings of Min and McIntosh, claim 1 is believed to be clearly patentable over all three references. As claim 5 includes the elements of claim 1 and moreover adds additional features, claim 5 is also believed to be clearly patentable. Favorable reconsideration is respectfully requested.

Applicant respectfully traverses the Examiner's rejection of claims 6 and 7 under 35 U.S.C. §103(a) as being unpatentable over Min, in view of McIntosh, and further in view of Pasch et al., U.S. Patent No. 6,021,955. Claims 6 and 7 depend from claim 1, which is distinguished above as being clearly patentable over Min and McIntosh. As Pasch et al. is not

believed to remedy the noted shortcomings of Min and McIntosh, claim 1 is believed to be clearly patentable over all three references. As claims 6 and 7 include the elements of claim 1 and moreover add additional features, claims 6 and 7 are also believed to be clearly patentable. Favorable reconsideration is respectfully requested.

Applicant respectfully traverses the Examiner's rejection of claims 9-25, 27 and 28 under 35 U.S.C. §103(a) as being unpatentable over Min in view of McMillan et al., U.S. Patent No. 6,979,965. One of the requirements of a *prima facie* obviousness rejection is that the cited combination must disclose or suggest each and every claimed element. At a minimum, this requirement has not been met.

Independent claim 9 has been amended to recite:

> 9. (Currently Amended) An actuator assembly configured for securement to a water valve having a valve with a valve stem, the actuator assembly comprising:
>
> a gear assembly configured to engage the valve stem;
>
> a motor having an output shaft that is configured to drive the gear assembly in a first direction; and
>
> biasing structure including one or more linear springs configured to drive the gear assembly in a second direction;
>
> a brake for reducing or limiting rotational velocity of the output shaft of the motor when the biasing structure is driving the gear assembly in the second direction, the brake is configured to limit the rotational velocity of the output shaft of the motor to less than 1000 ~~RPMs~~ RPM in order to eliminate water hammer that would otherwise be caused by the bias provided by the one or more linear springs.

It can be seen that claim 9 is directed to an actuator assembly that includes a motor configured to drive the valve in a first direction and a biasing structure that is configured to drive the valve in a second direction. A brake is configured to reduce the rotational velocity of the motor to less than 1000 RPM when the biasing structure is closing the valve in order to eliminate water hammer that would otherwise be caused by the one or more linear springs. As discussed above, Min does not disclose using one or more linear springs. Min does not disclose or suggest using a spring that would cause water hammer and thus cannot be considered as describing or suggesting a way to eliminate water hammer.

As Min does not disclose or suggest the claimed limited rotational velocity of 1000 RPM, the Examiner relies upon McMillan et al. to disclose this feature. However, one of skill in the art would clearly recognize that McMillan et al. is directed to opening and closing air dampers. One of skill in the art would clearly recognize that there are substantial differences between opening and closing a water valve, thereby regulating an incompressible fluid, and opening and closing an air damper, thereby regulating a highly compressible fluid. One of skill in the art would clearly not look to McMillan et al. in changing or adapting the valve disclosed by Min, and in particular, the rotational speeds set forth therein. One skilled in the art would also clearly recognize that the parameters used for an air damper would not be the same as the parameters that might be used for a water valve. The application, purpose and configuration would be based on a completely different set of conditions and considerations. Indeed, Applicant does not believe that McMillan et al. represents analogous art, at least for the specific design parameters set forth in McMillan et al. For these and other reasons, the cited combination cannot be considered as describing or suggesting the claimed invention as recited in claims 9-20. Favorable reconsideration is respectfully requested.

Turning now to claim 21, which recites:

> 21. (Previously Presented) A valve assembly, comprising:
> a valve having an open position and a closed position;
> an actuator assembly coupled to the valve, the actuator assembly configured to move the valve between the open position and the closed position;
> wherein the actuator assembly comprises a damping mechanism configured to limit a speed of the valve when the actuator assembly is moving the valve from the open position to the closed position such that the valve moves from the open position to the closed position in 4 seconds or more, but does not significantly limit the speed when the actuator assembly is moving the valve from the closed position to the open position.

It can be seen that claim 21 is directed to a valve assembly that includes a damping mechanism that slows the valve speed when the valve is closing but does not significantly limit the valve speed when the valve is opening. Claim 21 also recites that it takes at least 4 seconds for the actuator assembly to move the valve from the open position to the closed position. As noted above, Min does not describe a damping mechanism that is configured to slow the actuator

assembly in this manner. The Examiner relies upon McMillan et al. to disclose a closing time of 4 seconds or more, noting that McMillan et al. disclose a closing time of 90 seconds. However, and as discussed above, McMillan et al is directed to an air damper, and as such, has no applicable bearing on the design of a water valve. Thus, the cited combination cannot be considered as describing or suggesting the claimed invention as recited in claims 21-25. Favorable reconsideration is respectfully requested.

Turning now to claim 27, which recites:

> 27. (Previously Presented) A valve assembly, comprising:
> a valve having an open position and a closed position;
> a valve stem operatively attached to the valve;
> a gear assembly configured to engage the valve stem;
> a motor configured to drive the gear assembly to the open position; and
> one or more springs configured to drive the gear assembly to the closed position;
> wherein the motor comprises a damping mechanism for limiting rotational velocity of the motor when the one or more springs are driving the gear assembly to the closed position, wherein the damping mechanism is configured to limit the rotational velocity of the motor only after the rotational velocity of the motor exceeds a threshold speed, wherein the threshold speed is 1000 RPM ~~RPMs~~ or less.

As can be seen, claim 27 is directed to a valve assembly that includes a motor that is configured to drive the valve open, one or more springs that are configured to drive the valve closed and a damping mechanism that limits motor speed when the springs are driving the valve closed and the motor speed exceeds a threshold speed that is no more than 1000 RPM. As detailed above, Min does not disclose or suggest a specific speed at which the damping mechanism is activated. The Examiner relies upon McMillan et al. to disclose limiting the rotational velocity of the motor only after the rotational velocity of the motor exceeds a threshold speed, wherein the threshold speed is 1000 RPM or less. However, as discussed above, McMillan et al. is directed to an air damper, and as such, has no applicable bearing on the design of a water valve. Thus, the cited combination cannot be considered as describing or suggesting the claimed invention as recited in claims 27-28. Favorable reconsideration is respectfully requested.

Applicant respectfully traverses the Examiner's rejection of claim 26 under 35 U.S.C. §103(a) as being unpatentable over Min, in view of McMillan et al., and further in view of Pasch et al. Claim 21, from which claim 26 depends, is distinguished above as being patentable over Min and McMillan et al. As Pasch et al. is not believed to remedy the noted shortcomings of Min and McMillan et al., claim 21 is believed to be clearly patentable over all three references. Indeed, like McMillan et al., it is noted that Pasch et al. appear to be directed to air dampers. Claim 26 includes the elements of claim 21 and adds further distinguishing features. Thus, claim 26 is also believed to be clearly patentable over all three references. Favorable reconsideration is respectfully requested.

Applicant respectfully traverses the Examiner's rejection of claims 33 and 34 under 35 U.S.C. §103(a) as being unpatentable over Min, in view of McIntosh, and further in view of McMillan et al. Contrary to the Examiner's assertions, the modified Min cannot be considered as describing or suggesting the features of claim 1, from which claims 33 and 34 depend. Thus, for the reasons set forth above, as well as other reasons, dependent claims 33 and 34 are also believed to be clearly patentable over the cited combination. Favorable reconsideration is respectfully requested.

Reconsideration and reexamination are respectfully requested. It is submitted that, in light of the above remarks, all pending claims are now in condition for allowance. If a telephone interview would be of assistance, please contact the undersigned attorney at 612-359-9348.

Respectfully submitted,

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